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Lilly HOSPITAL PHARMACY SURVEY 1986

A survey of the 1985 operations of
1,651 hospital pharmacies
provided to hospital pharmacy directors
in the interest of sound management

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FOREWORD

For a decade, directors of hospital pharmacy throughout the country have participated in the LILLY HOSPITAL PHARMACY SURVEY. During early 1986, 1,651 pharmacists reported financial information, personnel requirements, and other data describing their pharmacies for the operating year 1985.

The format of this year's edition of the SURVEY is much like that of last year's. No attempt has been made to define or structure the sample, nor does the report claim to describe what constitutes optimal or successful hospital pharmacy practice. The SURVEY represents averages of the data reported.

Since not all hospital pharmacists answered every question in the SURVEY, some of the charts and tables are based on data from fewer than the total number of respondents. In some tabulations, sample sizes were not large enough to be statistically useful, and these are designated as "n.a." (not available).

Eli Lilly and Company is grateful to all hospital pharmacists who contributed their operating figures to the SURVEY. It is hoped that the LILLY HOSPITAL PHARMACY SURVEY will be helpful to managers as they conduct hospital pharmacy operations throughout the United States.

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EXECUTIVE SUMMARY

Key operating data tabulated to reflect a composite profile of the "average" hospital pharmacy in the United States appear in Table 1. This hypothetical hospital pharmacy is derived mathematically from data supplied by the 1,651 SURVEY respondents. As such, these figures are probably too general to be used for direct comparison. The comparative analysis work sheet on page 18 is provided for this purpose. However, industry trends can be determined by comparing current statistics with similar figures from earlier editions of the LILLY HOSPITAL PHARMACY SURVEY.

Table 1 shows that the average hospital had a bed capacity of 244 in 1985—essentially unchanged from the figure reported for the previous year. Census continued the decline that began earlier in the decade (from 74% in 1980 to 60% in 1985). Admissions remained virtually unchanged from the previous year's figure. A substantial reduction in length of patient stay was again recorded by SURVEY participants—down to 6.2 days from 6.6 days reported for 1984. Length of patient stay has declined more than one full day since 1982. Consistent with an ongoing trend, the largest segment of reporting hospitals were private, nonprofit, general institutions.

The number of hours worked by pharmacists, technicians, and support personnel as well as the hours the central pharmacy was open rose during 1985. Overall, the total hours worked per week by the pharmacy staff increased just over 6%, whereas the central pharmacy was open about 3% longer. The hours of pharmacist time required for each hour the central pharmacy was open during 1985 increased slightly from 3.0 to 3.1. The ratio of technician hours worked to hours open also rose (from 2.7 to 2.8), whereas the figure for support personnel was approximately the same as that calculated for 1984.

For the second consecutive year, the dollar value of inventory did not show an increase over the previous year's figure. However, purchases were more than 9% higher, with the result that the estimated inventory turnover rate rose from 7.8 times to 8.5 times. It is important to note that, on a per-occupied bed basis, inventory and purchases figures were more than 5% and 15% higher respectively than in 1984. The inventory turnover rate has increased almost two full turns since 1982. This improvement suggests that hospital pharmacy managers are achieving their goal of controlling inventory investment, which has a positive effect on total hospital cash flow. It is of interest to note that, if the inventory turnover rate had remained at 7.8 times during 1985, inventory would have been nearly $11,000 higher—9.1% more than the figure for 1984.

Comparison of data representing two or more years' operations may be more accurately expressed in terms of patient days. During 1985, inventory equaled $2.27 per patient day—up 5.1% from

Table 1 *Average hospital pharmacy*

	1985 (1,651 Hospitals)	1984 (1,964 Hospitals)	Percent of Change
Bed capacity	244	245	−0.4%
Class	private nonprofit	private nonprofit	
Profile	general	general	
Census (occupied beds)	60%	63%	
Admissions	8,566	8,582	−0.2%
Patient days	53,436	56,338	
Length of patient stay	6.2 days	6.6 days	
Hours central pharmacy open/week	100	97	+3.1%
Pharmacist hours/week	309 (7.7 FTE)	290 (7.3 FTE)	+6.6%
Technician hours/week	276 (6.9 FTE)	260 (6.5 FTE)	+6.2%
Support personnel hours/week	114 (2.9 FTE)	109 (2.7 FTE)	+4.6%
Inventory	$121,198	$121,414	−0.2%
	$ 2.27/patient day	$ 2.16/patient day	+5.1%
	$ 497/bed	$ 498/bed	−0.2%
	$ 828/occupied bed	$ 786/occupied bed	+5.4%
	$14.15/admission	$14.15/admission	unchanged
Purchases	$1,032,831	$944,569	+9.4%
	$19.33/patient day	$16.77/patient day	+15.3%
	$ 4,233/bed	$ 3,855/bed	+9.8%
	$ 7,055/occupied bed	$ 6,118/occupied bed	+15.3%
	$120.57/admission	$110.06/admission	+9.6%
Inventory turnover rate	8.5 times	7.8 times	
Floor area (central pharmacy)	1,799 sq ft	1,734 sq ft	
Services offered by over 70% of pharmacies:			
Monitoring patient profiles		Monitoring patient profiles	
Monitoring drug interactions		Monitoring drug interactions	
Providing drug information services		Providing drug information services	
Drug therapy consultation		Drug therapy consultation	

the 1984 figure. Purchases were $19.33 per patient day, an increase of 15.3%. Since these data do not take inflation into account, they do not reflect its influence on either costs or changing patterns of drug usage.

Floor area of the central pharmacy went from 1,734 square feet in 1984 to 1,799 square feet in 1985. Pharmacies have grown considerably since 1977, when floor area totaled 1,476 square feet. The continuing expansion of hospital pharmacy services, such as unit-dose and IV admixture programs, may be the main reason for this increase in central pharmacy size.

The ranking for the ten pharmacy services most commonly provided in 1985 is the same as for 1984. The four services shown in Table 1 were offered by over 70% of the hospital pharmacies that responded. Pharmacokinetic service, although not among the top four, exhibited the greatest growth rate during the period—from 27.7% in 1984 to 32% for 1985. All services listed in Table 1 posted higher figures for 1985 in comparison with the previous year's statistics. This suggests that hospital pharmacists are continuing to expand clinical services.

A comparison of selected operating statistics over the ten-year period that the LILLY HOSPITAL PHARMACY SURVEY has been published shows the following trends:

- Pharmacy hours open per week went from 74 to 100, an increase of 35.1%.
- Pharmacist hours worked per week more than doubled, from 152 to 309, an average increase of 10.3% each year.
- Technician hours worked per week varied but went up overall from 129 to 276—a 114% rise—for an average increase of over 11% a year.
- Inventory investment increased 76.6%, and the annual ten-year growth rate was 7.7%. Inventory per occupied bed rose 130%, an average of 13% each year.
- Purchases went up 217.4% over the decade, for an average annual growth rate of almost 22%. Purchases per occupied bed increased over $5,000, representing an average annual growth rate of over 31%.

The number and bed capacities of hospitals contributing data to the 1986 SURVEY are similar to those of previous samples. Hospitals with fewer than 200 beds accounted for 860 pharmacies, or 52.1% of the sample. A total of 302 hospitals with more than 400 beds are included in the SURVEY and make up 18.3% of the respondents.

The statistics in the 1986 LILLY HOSPITAL PHARMACY SURVEY continue to be weighted in favor of larger facilities. It should be noted that, on the basis of hospital classification, private, nonprofit institutions again account for the largest reporting segment at 62.9%—up from 61.7% recorded last year. Government hospitals (nonfederal) declined slightly from 24.6% of the total sample to 22.4% during 1985. As expected, general institutions are the largest category reporting within all classes at 65.5% (somewhat lower than the 70.3% figure recorded for 1984). Specialized hospitals make up 22.2% of participants—up from 19.6% reported in last year's SURVEY.

Physicians can request a nonformulary item in 92% (1,493 of 1,623) of hospital pharmacies that responded. This figure was 1% lower than last year's SURVEY figure. A total of 117, or about 7% of pharmacies, are also responsible for central supply service. Of these, almost half are involved in both administration and purchasing.

Operation of the pharmacy department by an outside management organization was reported by 89 (5.4%) respondents. General hospitals make up 82% of this total (73 facilities), whereas only nine were specialized institutions. About one in three participating hospitals indicated that they offered accredited medical resident/intern training programs, of which about 60% of those reporting were federal hospitals and about 40% were private, nonprofit institutions.

Computer utilization by hospital pharmacy departments continued to expand during 1985. Computers were used for patient billing in over 57% of reporting hospitals—up from 54% the previous year. Computer-generated formulary systems are used in 42.2% of hospitals (up 7% from the 1984 figure). Computers record patient profile information in over 38% of participating hospitals—up from about 29% last year.

Close to 83% of the hospital pharmacies participating in the LILLY HOSPITAL PHARMACY SURVEY use the unit-dose system as their primary method of drug distribution (covering at least 90% of the beds in these facilities). In addition, almost 73% (up from 70% last year) said that they provided full-coverage parenteral admixture service. Among reporting hospitals, 1,079 (65.4%) have both unit-dose and parenteral admixture services. Of these, 745 general and 263 specialized institutions provide both services to their entire patient population (68.9 and 71.7% respectively).

A total of 1,323 respondents, or about 91%, indicated that they dispense medication every 24 hours; less than 8% issue drugs at intervals greater than 24 hours. Less than 1% of participants said they dispensed drugs more than once a day. Over 94% of participants purchase pharmaceuticals in unit-dose packaging whenever possible—essentially the same percentage as that reported last year.

Twenty-four-hour pharmacy service is provided by about one in four hospitals reporting to the SURVEY. Round-the-clock service is offered by almost 14% of general hospitals reporting and by nearly 60% of the specialized hospitals. Among institutions providing this service, the pharmacist-technician ratio averages close to 1:1.

MARKET FACTORS

Trends in the Hospital Industry and Their Implications for Hospital Pharmacy Practice

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Change has become commonplace in the US health care industry over the last three years. The federal government has altered its reimbursement schemes for Medicare and Medicaid, public hospitals have been sold to private corporations, Health Maintenance Organizations (HMOs) have increased their market penetration, and businesses have redesigned their health benefit programs. These changes have directly and indirectly affected hospital pharmacy operations. Because of this activity, hospital pharmacy directors have begun to study health care trends with two questions in mind: (1) What changes due to these trends can they expect in the operation of their pharmacies, and (2) what steps should they take now in anticipation of future changes?

This section of the LILLY HOSPITAL PHARMACY SURVEY reviews recent developments in the financing and delivery of health care and discusses directions the US health care industry is taking. It concludes with some suggestions about what hospital pharmacy directors can do in preparation for these anticipated changes.

Status of Health Care Industry

In spite of federally mandated diagnosis-related groups (DRGs) and prospective payment systems (PPS), reimbursement schemes, and a decrease in patient days, many hospitals maintained relatively strong financial positions from 1983 until early 1985 because they implemented cost controls in their operations.

After passage in 1982 of the federally mandated reimbursement schemes for Medicare and Medicaid, hospital administrators initiated cost-containment plans. Implementing cost reductions is particularly difficult when the overall philosophy of operations was based on cost plus. Operating expenses and budgets for areas that could be targeted for cost reductions were reviewed. Non-personnel costs, eg, new equipment, travel, and other expenses, were curtailed, and managers were instructed to examine their departmental budgets to find ways of cutting costs.

To mitigate the detrimental effects of cost containment on morale, most hospital administrators limited wage increases instead of eliminating positions. In some departments, they did not replace personnel who voluntarily left the hospital's employ. For three years, hospital administrators have attempted to reduce their operational costs in such direct ways.

Nevertheless, by late 1985, these measures had not been sufficient to overcome significant declines in revenues caused by lower occupancy rates, increased competition from new forms of health care delivery, and pressure from all payers to provide services at a lower cost.

By 1982, the federal government's changes in reimbursement systems for hospital services, together with changes in private payers' programs had had important effects on hospitals. These changes encouraged physicians to discharge patients earlier, questioned in various ways the need for admission, and called for testing to be done on an outpatient basis. As a result, occupancy rates fell from 74% in 1980 to 60% in 1985.* It is unlikely that Congress will alter its DRG system in any major way in the near future. Moreover, similar programs are being adopted by private insurance companies. Thus, occupancy rates may well be below 60% by 1990. This could mean that perhaps up to 30% of current hospital capacity will be unused and may, therefore, disappear within the next ten years.

Another effect of public and private sector changes in reimbursement policies has been to foster the development of newer forms of health care delivery, which have become competitors of hospitals. HMOs, largely undeveloped in the mid-70s, began to grow rapidly in the early 1980s. Because of this rapid growth, HMOs are exerting increasing pressure on some hospitals to consider lower than normal rates for HMO patients.

In the face of declining federal funds, hospitals have turned to outpatient services for additional revenues. For years, they had provided these services through their emergency rooms. Why not aggressively promote them now? Many hospitals have been doing so. In fact, outpatient revenues rose from about 13% of total services in 1980 to nearly 17% in 1985.[1] Ambulatory care centers (ACCs) have been on the scene for some time and are growing rapidly. Since 1983, the number of ACCs has increased to 3,000—a 400% rise. Forecasters are predicting that, by the year 1990, there will be approximately 5,000 ACCs in the United States. In 1985, the average number of patient visits per ACC was about 19,000. This figure is expected to be over 22,000 by 1990.

The government's freezing of Medicare payments for 1986 and the new budgetary controls that will no doubt be implemented as a result of Gramm-Rudman will have an adverse impact on the financial operations of hospitals, especially those institutions where Medicare payments account for 40% or more of revenues. The Federation of American Hospitals estimates that the proposed federal budget for 1986 will have trimmed $5.2 billion from Medicare and $1.2 billion from Medicaid funds. Moreover, hospital costs may begin to go back up in 1986 because of rising wages and commodity prices.

The growth rate of HMOs is beginning to show signs of slowing down. One reason that some employers are switching from HMOs may be because they have not produced projected savings. Employers usually offer two or three types of health benefit packages to

*LILLY HOSPITAL PHARMACY SURVEY, 1986.

their employees. Some employers are finding that their health benefit costs are increasing because premiums for conventional insurance programs have risen sharply. In such cases, premiums have increased because older, sicker employees are enrolling in conventional insurance programs, while younger, healthier employees select HMO plans. Overall costs have increased because, under current federal regulations, employers must make the same contributions per employee to federally certified HMOs that they make to conventional insurance plans. If the regulations change, HMOs may lose revenues because premiums will become more competitive. Also, national HMOs are just beginning to enter very competitive markets, eg, Chicago and New York, which may begin to affect their revenues adversely.

The role of hospitals is changing from caretaker of the ill to promoter of health for the well. Hospitals will probably continue to move into the nursing home and home care markets. There will be vertical integration, with hospitals establishing their own sources of patients through ambulatory care centers, PPOs, HMOs, and networks. Like banking and other service industries, the health care industry may be dominated by a few large national companies—"super-med" complexes that will function as huge service-insurance conglomerates. There is evidence that this trend has already begun. Voluntary Hospitals of America (VHA) entered the insurance market by joining forces with Aetna Life Insurance Company in order to offer employers a health plan with a premium guaranteed not to rise faster than the Consumer Price Index (CPI). Prudential Insurance Company has joined forces with Group Health Inc, a Minnesota-based HMO; under the Prudential Group Health Plan, members have a choice between an HMO or a non-HMO doctor. If they choose the non-HMO doctor, Prudential will not cover the full cost of the visits. A study conducted in 1983 by Arthur Andersen & Company forecasted many of these trends. Because some of these predictions have already occurred, it is appropriate to review the results of this study as we begin the second half of the 1980s. (See Table 2.)

Future Trends in the Health Care Industry

In the summer of 1983, realizing that significant changes were about to take place because Congress had just implemented changes in the Medicare reimbursement system, Arthur Andersen & Company and the American College of Hospital Administrators agreed to conduct a Delphi forecasting study of the US health care delivery system.[1] In such a study, a group of experts acting independently of each other arrives at a consensus. Usually, panels of experts evaluate and comment on current issues in order to make predictions about future developments. In the Delphi study, six panels of experts involving 1,000 people were surveyed, including well-known hospital leaders, physicians, pharmacists, nurses, and other health care providers as well as legislators, regulators, suppliers, and payers.

The Delphi report was divided into seven areas: social philosophy, regulations, payment systems, competition and marketing, human resources, corporate structure, and finance. The panel members were asked to express their views on developments that could take place in the health care industry through 1990. The report, completed in July of 1984, identified trends and presented strategies for hospitals, physicians, and patients.

The panels predicted that multihospital systems would continue to

Table 2 *Ranking of recommendations for reducing health care costs in the United States (1 = most cost-effective)*

	All Panels	Hospitals	Physicians	Other Providers	Legislators/ Regulators[1]	Suppliers	Payers
Emphasize alternate delivery systems	1	1	2	1	1	1	1
Increase patient deductibles and coinsurance	2	2	1	2		2	
Implement a different payment system (eg, capitation, voucher, all-payer DRG system, etc)	3			3	3	3	
Increase public awareness of wellness and preventive medicine					2		
Streamline the health care delivery system (eliminate overbedding and duplication of services)			3				2
Improve productivity of health care providers		3					
Increase competition							3

grow; investor-owned hospitals would substantially increase in number and become more profitable; the dollar amount spent nationally on health care services would rise; new providers would erode the acute care inpatient hospitals' share of the health care market; the emphasis in health care would shift to ambulatory care services and other alternative delivery systems; hospitals would be at a disadvantage in attracting investors; many hospitals would create new corporate structures and launch business ventures in order to compete for capital; and hospitals and their medical staffs would collaborate on behalf of patients.

The study also predicted that, during the next decade, the success of health care providers would depend on strategic and financial planning, refined management skills, risk identification and analysis, integrated clinical and financial cost accounting, prudent application of new technology, predictive market analysis, and computerized decision-support systems. The consensus of the panels was that health care would undergo an accelerated rate of change.

One of the more interesting analyses in this study was a comparison of each group's top three ideas (see Table 2) for reducing the cost of health care in the United States. The data in Table 2 show that there are differences of opinion between providers and payers. In retrospect, it now appears that the forecasts made by corporations, the primary payers of American health care costs, were the most accurate.

Corporate Strategies to Contain Health Care Costs

As recently as 1981, many chief executive officers showed little awareness of the cost of the health benefit programs that were offered to their employees. Today, for most manufacturers, these benefits are their third largest expense, after raw materials and straight-time pay. For most service-oriented companies, these costs are the second largest. Industries with large unions have been affected most by rising health care costs, and they are now paying closer attention to these costs, tailoring their health care plans in order to save money.

Corporations have adopted three basic strategies to contain health care expenses: (1) instituting programs to motivate employees to modify their demand for health care by means of changes in the design and administration of health insurance policies, (2) changing the structure of health care systems by using alternate plans and by participating in coalitions, and (3) promoting behavior modification programs that will help lower the need for health care, eg, diet control, smoking cessation, treatment of alcohol and drug abuse, and management of stress, as well as blood pressure screening programs.[2] Redesigning health care insurance benefits is the primary method corporations are considering in order to control program costs. Changes in payment schemes and limits on services covered are two ways used by corporations to modify health care plans. Other approaches include PPOs, HMOs, preadmission verification, and second opinions. Some companies are offering financial incentives to their employees if they choose outpatient rather than inpatient surgery.

Effects of Change on Hospital Pharmacy Practice

Virtually every department in most hospitals is now under scrutiny by hospital administrators. Pressures from federal benefit reductions, corporate demands for lower-cost health care services to employees, competition, and predicted higher labor and commodity prices may force administrators to examine departmental costs even more closely in 1986.

Hospital pharmacies were one of the first cost-containment targets of hospital administrators, according to a recent survey.[3] The key cost-control strategies cited in this survey include programs for reducing inventories, tracking inventory and product use, obtaining favorable pricing and purchasing terms by joining forces with other hospitals to negotiate group-buying contracts, and centralizing purchasing and materials management functions within hospitals.

Accomplishing these goals while maintaining quality services will become even more challenging in 1986 and the years to come.

Traditionally, the hospital pharmacy department has been an integral part of a hospital's operation because it supplied tangible products needed in the care of patients. During the late 1970s and early 1980s, hospital administrators also came to realize the benefits of the clinical services provided by their pharmacists. The hospital pharmacy department was also able to generate significant excess revenues, which were used to operate other departments within the hospital. Because of these

factors, hospital pharmacy directors play a significant role in developing plans to control costs and seek new sources of revenue.

Pharmacy directors have increased the efficiency of their departments since 1982. Inventory costs, which are a significant component of a pharmacy department's nonpersonnel operating costs, are down. Like their community pharmacy counterparts, hospital pharmacists have discovered that channeling purchases through one wholesaler yields economies of scale. As a result, inventory turnover has gone from 6.6 times in 1982 to 8.5 times in 1985, indicating that using a single wholesaler is cost-effective.

Because it is difficult to realize significant cost savings from nonpersonnel costs, further reductions in revenues from Medicare and Medicaid could mean that services will be reduced and that some staff positions will be lost in 1986. Hospital pharmacy directors will need to use cost-effectiveness and cost-benefit analyses to justify retaining personnel in their departments, and they will be forced to broaden their revenue bases. Recognizing that the future of hospital pharmacy lies in the implementation of new cost-effective clinical services, the ASHP in January of 1986 solicited proposals for studies that may lead to the development of a standard method for measuring the cost impact of clinical pharmaceutical services in organized health care settings.

One of the most challenging tasks directors will have is to develop services that are more cost-effective and to find additional sources of revenue to support these services. They must take cues from their administrators and participate in nonpharmacy department services, and they must work with their administrators to determine their role in delivering new services that other hospital departments are planning to implement. For example, pharmacy can play an important part in family planning, AIDS, family violence, nutrition, home health care, diet, and exercise programs. Directors should focus on developing additional revenues from such services.

Pharmaceutical manufacturers that are aware of the trend toward outpatient services will be emphasizing the development of premixed drugs deliverable in outpatient settings and will promote new packaging and delivery systems via transcutaneous and subcutaneous routes. Because inventories will be limited and labor costs high in the outpatient setting, manufacturers will be focusing on the development of delivery systems that reduce these costs. Drug companies will also have to rely on cost-benefit and cost-effectiveness ratios to prove to pharmacy and therapeutics committees that drugs can save the hospital money and decrease the patient's length of stay. This requires a change in thinking from a commodity-oriented base to one of providing therapy that can heal the patient over a shorter span of time.

Like other health professionals, pharmacists must monitor the quality of their services. In their haste to control costs, hospital administrators may inadvertently institute measures that can adversely affect the quality of these services. When this happens, hospital pharmacists will have to bring the problem to their administrators' attention and fight to maintain the quality of the services offered by the hospital pharmacy.

In summary, hospital pharmacy continues to maintain a strong position within hospitals. Nevertheless, to retain the integrity of their departments, directors will have to justify existing services through cost-effectiveness and cost-benefit analyses, continue to investigate new revenue sources, and maintain high standards. Hospital pharmacists and their staffs must focus attention on giving the patient the most effective therapy, delivered in the shortest time.

1. Arthur Andersen & Company, American College of Hospital Administrators. *Health Care in the 1990's: Trends and Strategies*. Chicago, 1984.
2. Herzlinger RE, Schwartz J. How companies tackle health care costs: Part I. *Harvard Business Review* 1985; 63:69.
3. Hospital cost containment forgets pharmaceuticals rank first. *Weekly Pharmacy Reports, The Green Sheet* 1984; 32:2.

INVENTORY AND PURCHASES

Inventory and purchases figures for pharmacies located in general and specialized hospitals are presented in Table 3. The table shows that, with increasing hospital size, average inventory and purchases rise dollarwise. A two-year comparison shows that most of these figures were lower for general hospitals during 1985, regardless of their size. On the other hand, review of similar data for specialized institutions indicates that their inventory and purchases figures for 1985 tended to rise with increasing bed capacity. The estimated inventory turnover ratio for both general and specialized facilities trends steadily upward as hospital size increases. A comparison of 1984 and 1985 inventory turnover data suggests generally higher turnover ratios for 1985, regardless of hospital size or profile, which reflects continuing improvement in inventory control. Specialized institutions tend to have faster inventory turnover, particularly in the larger hospitals, as compared with that in general hospitals of similar size. Specialized facilities also report higher inventory and purchases figures within each bed range. One reason for these higher figures may be that the pharmacy services offered in these hospitals are more sophisticated as the result of a more diverse patient population and, thus, more expensive. Since almost all specialized hospitals reporting to the SURVEY had more than 100 beds, many of the following tables do not contain data for hospitals in the lower bed ranges.

Table 3 also reflects inventory and purchases statistics on the basis of annual patient days. In general hospitals, inventory per annual patient day tends to go down as hospital size increases. Purchases per annual patient day, on the other hand, appear to be relatively stable. In comparison with similar data from last year's SURVEY, inventory and purchases figures per annual patient day were usually higher in general hospitals of all sizes. In specialized institutions, inventory per annual patient day remains much the same, even with increasing hospital size. However, purchases per annual patient day tend to show an upward trend with increasing bed capacity. Specialized hospitals also post higher costs for inventory and purchases per annual patient day as compared with those reported for 1984.

Table 4 shows statistics for hospital pharmacies with inventory and purchases that include IV fluids, irrigation solutions, and blood fractions. It follows that pharmacies stocking these items have higher inventory and purchases figures both in actual dollar amounts and as expressed in terms of annual patient days.

A total of 345 respondents (26% of the sample) said that medical school faculty are on staff at their hospital. SURVEY data reveal that inventory and purchases figures tend to be higher in hospitals with

Table 3 *Pharmacy inventory and purchases*

General

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	$ 23,109	$ 105,209	4.6	5,848	$3.95	$17.99
50-99	39,067	210,056	5.4	13,179	2.96	15.94
100-199	66,774	468,284	7.0	29,140	2.29	16.07
200-299	106,285	898,611	8.5	56,799	1.87	15.82
300-399	152,178	1,351,508	8.9	82,118	1.85	16.46
400-499	198,518	1,772,935	8.9	101,226	1.96	17.51
Over 499	220,746	2,164,066	9.8	144,143	1.53	15.01

Specialized

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	n/a	n/a	n/a	n/a	n/a	n/a
50-99	n/a	n/a	n/a	n/a	n/a	n/a
100-199	$ 93,147	$ 833,223	8.9	34,643	$2.69	$24.05
200-299	128,084	968,228	7.6	56,645	2.26	17.09
300-399	194,657	1,674,908	8.6	80,810	2.41	20.73
400-499	254,240	2,424,931	9.5	115,505	2.20	20.99
Over 499	415,578	4,156,613	10.0	183,434	2.27	22.66

*Estimated inventory turnover ratio = $\frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

faculty on staff than in those without. In such institutions, there is a tendency to involve interns and residents in various kinds of diagnostic and treatment decisions that often require an expanded drug formulary. Specialized hospitals with more than 300 beds that have medical school faculty on staff report, on the average, inventory and purchases figures about 15% higher than those of the overall sample.

A total of 747 (nearly 47%) hospital pharmacy managers said that their inventory and purchases included such items as radiographic agents, anesthetic fluids, special diet products, and hyperalimentation materials. When SURVEY data are used for comparative analysis, average inventory and purchases figures should be increased somewhat to compensate for the cost of these items if they are a part of normal inventory.

The percentage of purchases of pharmaceuticals and related items from wholesalers by hospital pharmacy departments are tabulated below. These data reflect figures according to hospital size for operating years 1985 and 1984.

Wholesaler Purchases (%)

Bed Capacity	1985 (1,614 hospitals)	1984 (1,905 hospitals)
Under 50	80%	73%
50-99	80%	75%
100-199	80%	71%
200-299	72%	65%
300-399	70%	59%
400-499	65%	58%
Over 499	55%	45%
Total	73%	66%

Consistent with previous trends, the percentage of pharmaceuticals and related items bought from wholesalers generally declines with increasing hospital size. It is worth noting, however, that wholesaler purchase percentages increased in all hospitals as compared with the previous year's figures. This increased use of wholesalers may, in part, be responsible for the dramatic improvement in inventory turnover, resulting in a favorable impact on cash flow. Overall, 73% of pharmaceutical purchases by hospital pharmacies were made through wholesalers during 1985—up 7% from the previous year's figure. General hospitals with fewer than 200 beds purchased more than 80% of their goods from wholesalers, whereas facilities in the 200- to 500-bed range order over 70% of their drugs and related items from this source. Specialized institutions having fewer than 500 beds, on the average, use wholesalers for more than 70% of their hospital pharmacy stock.

SURVEY data also indicate that profit hospitals order 87% of their pharmacy merchandise through wholesalers (up from 81% reported in last year's SURVEY). Private, nonprofit institutions purchase 76% of goods via wholesalers (up from 68% in 1984).

Government facilities buy 68% of their stock from wholesalers—8% more

Table 4 *Pharmacy inventory and purchases that include IV fluids, irrigation solutions, and blood fractions*

General

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	$ 27,829	$ 120,090	4.3	6,095	$4.57	$19.70
50-99	40,867	226,775	5.5	11,853	3.45	19.13
100-199	75,445	591,857	7.8	28,880	2.61	20.49
200-299	120,209	1,008,160	8.4	55,080	2.18	18.30
300-399	n/a	n/a	n/a	n/a	n/a	n/a
400-499	n/a	n/a	n/a	n/a	n/a	n/a
Over 499	n/a	n/a	n/a	n/a	n/a	a

Specialized

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	n/a	n/a	n/a	n/a	n/a	n/a
50-99	n/a	n/a	n/a	n/a	n/a	n/a
100-199	n/a	n/a	n/a	n/a	n/a	n/a
200-299	n/a	n/a	n/a	n/a	n/a	n/a
300-399	$214,340	$2,013,323	9.4	75,785	$2.83	$26.57
400-499	299,129	3,102,462	10.4	117,375	2.55	26.43
Over 499	467,780	4,973,671	10.6	182,134	2.57	27.31

*Estimated inventory turnover ratio = $\frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

than in 1984. Federal hospitals obtain 10% from wholesalers, a 5% increase over the 1985 SURVEY figure. Comparison of these data with similar statistics from last year's SURVEY suggests a greater reliance on the wholesaler as a provider of the pharmaceutical products required to maintain adequate patient services.

Selected operating figures for two consecutive years from two groups of large (over 500-bed), private, nonprofit, specialized hospitals were compared to evaluate the effect of purchasing from wholesalers (Table 5). Those purchasing between 20 and 39% (Group I) of their pharmaceutical needs from wholesalers reported higher purchases figures for 1985 than for 1984; however, their inventory was lower, with the result that their inventory turnover rate increased from 7.2 to 8.5 times. Those hospitals that used the wholesaler to obtain more than 39% (Group II) of their drug needs showed a slight increase in inventory investment for the two-year period. However, purchases for this group increased substantially, resulting in an inventory turnover rate of 10.5 times per year—the highest value recorded in the SURVEY for any hospital group. These wholesaler-oriented pharmacies posted lower figures for inventory and purchases than did those in Group I. As shown in Table 5, the median wholesaler purchases percentage rose from 75 to 80 in the wholesaler-oriented hospitals during the reporting period. This suggests that those specialized hospitals using wholesalers for a large portion of their drug needs enjoy the benefits of faster stock turnover, which can be translated into improved cash flow.

Review of SURVEY data indicates that 94% of participating hospital pharmacies are affiliated with cooperative purchasing groups (up from 92% reported for 1984). Almost 97% of general hospitals report a similar affiliation as do 94% of the specialized institutions. Further review of the data shows that 86% of cooperative members buy over one half of their drug-related products through a buying group. SURVEY data also reveal that virtually all respondents (99%) who belong to cooperatives buy pharmaceuticals, and 74% also purchase IV fluids and related items through these buying organizations. Only about 9% of goods obtained through buying groups are not pharmaceutical items. A total of 114 (about 8%) cooperative-affiliated hospitals said that their inventory was held and delivered by the buying organization (down from just under 10% in last year's SURVEY).

The regional breakdown of hospitals reporting buying group membership is as follows:

East North Central States	96.1%
Mountain States	95.5%
Pacific States	94.5%
Middle Atlantic States	94.1%
West North Central States	93.5%
South Atlantic States	93.2%
East South Central States	92.6%
New England States	92.6%
West South Central States	92.0%

A comparison with similar statistics from the previous reporting period shows that the Middle Atlantic States reported the largest increase in cooperative membership, while the New England States posted the largest decrease.

Table 5 *Wholesaler purchases and inventory patterns in large (>500 beds) specialized hospitals*

	1985 Wholesaler Purchases (%)		1984 Wholesaler Purchases (%)	
	Group I	**Group II**	**Group I**	**Group II**
	20%-39%	**Over 39%**	**20%-39%**	**Over 39%**
Median purchases	35%	80%	30%	75%
Inventory	$ 571,346	$ 352,362	$ 582,801	$ 348,640
Purchases	$4,882,490	$3,712,999	$4,212,006	$3,431,817
Turnover rate	8.5 times	10.5 times	7.2 times	9.8 times

PHARMACY STAFF COMPENSATION

Average annual payroll for each of three pharmacy department staff components as well as total annual payroll are shown in Table 6. These data are tabulated according to hospital size and profile. The average hourly wage figures for pharmacists, technicians, and support personnel yield useful comparisons. Since these are composite figures, they cannot be considered as direct measures of actual salaries. The hourly rate for pharmacists tends to be relatively stable in general hospitals, regardless of size. In specialized institutions, however, this statistic appears to fluctuate across bed ranges. The hourly rate for technicians in both general and specialized facilities also seems to vary across hospital size. The hourly rate for support personnel in specialized hospitals tends to remain relatively stable as bed size increases, until the highest bed range is reached. However, this figure appears to fluctuate in general hospitals. In both general and specialized institutions, the hourly salary for pharmacists appears to range between $15 and $16. Hourly salaries for pharmacists are higher in specialized hospitals when compared with those in general facilities of similar size. The hourly wages for technicians appear to be in the $6 to $7 range, regardless of hospital profile. It should be kept in mind that the data for support personnel may be influenced by the volunteer work force present in many hospitals. SURVEY data further suggest that, in larger, more sophisticated institutions that usually offer expanded services, hourly wage figures tend to be higher than in smaller hospitals with limited services.

Examination of SURVEY statistics reveals that pharmacists and technicians are employed about 2.1 and 1.9 hours respectively per occupied bed per week. These figures are higher than those recorded in last year's SURVEY, and they have been rising for the past several years, suggesting that pharmacy services to hospital patients continue to expand.

Outside funding for a portion of pharmacy activities was reported by only 4% of SURVEY participants. These monies generally are in the form of grants and/or stipends. Respondents also indicated that about 80% of these funded hours are allocated to clinical pharmacy practice. External funding for a portion of pharmacist hours was reported by about 18% of hospitals having more than 500 beds. In such institutions, this funding accounted for over 9% of total pharmacist hours worked per week. Over 80% of these hours were devoted to clinical practice.

Table 6 *Pharmacy personnel hours and payroll*

General

Bed Capacity	Pharmacist Hours/Week	Annual Pharmacist Payroll	Technician Hours/Week	Annual Technician Payroll	Support Personnel Hours/Week	Annual Support Personnel Payroll	Total Annual Payroll
Under 50	45	$ 35,325	41	$ 12,266	17	$ 4,346	$ 51,937
50-99	81	64,689	71	21,843	31	9,502	96,034
100-199	164	131,703	133	46,227	54	16,979	194,909
200-299	286	230,966	227	85,306	74	25,267	341,539
300-399	417	355,790	350	143,114	102	39,203	538,107
400-499	545	429,277	492	169,333	125	41,568	640,178
Over 499	727	595,321	543	195,999	152	53,774	845,094

Specialized

Bed Capacity	Pharmacist Hours/Week	Annual Pharmacist Payroll	Technician Hours/Week	Annual Technician Payroll	Support Personnel Hours/Week	Annual Support Personnel Payroll	Total Annual Payroll
Under 50	n/a	n/a	n/a	n/a	n/a	n/a	n/a
50-99	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100-199	234	$213,776	210	$ 71,914	71	$ 25,071	$ 310,761
200-299	320	264,932	268	89,456	77	25,638	380,026
300-399	529	429,661	416	167,071	142	44,286	641,018
400-499	651	606,173	553	195,156	182	55,698	857,027
Over 499	1,162	962,674	1,044	393,378	329	121,865	1,477,917

GEOGRAPHIC SUMMARY

Table 7 shows a summary of selected operating statistics arranged according to geographic region. The Middle Atlantic States have traditionally reported the highest average bed capacity, central pharmacy floor area, and census figures. One explanation may be that hospitals in this region include more psychiatric, rehabilitation, and long-term-care facilities, which characteristically have more beds and longer patient stays. Institutions in this region also recorded the lowest figures for inventory and purchases per occupied bed, while the Mountain States posted the highest. Hospitals in the East North Central States reported being open the highest number of hours and, understandably, had the highest number of pharmacist hours worked per week. The South Atlantic States posted the most technician hours worked per week, and the Mountain States reported the fewest. Support personnel worked the most hours per week in hospital pharmacies in the West South Central States and the fewest hours in the Mountain States. Average hospital size was smallest in the Mountain States, where some of the lowest census figures were also recorded. Thus, it is expected that these institutions would also post the fewest pharmacy staff hours. Census was lowest of all in hospitals in the West South Central States. Only three of the nine regions recorded an average census figure of more than 60%, and virtually every region posted lower census figures for 1985 than for 1984. Another point worth noting is that pharmacy hours open did not decrease in any region during 1985. In addition, pharmacy staff hours worked remained virtually the same or increased in all regions except one. These data suggest that, although hospital patient load may be down from the previous year, pharmacy staff activity in support of patient care actually appears to have increased during 1985.

Table 7 *Geographic summary of selected operating data*

Region	Bed Capacity	Inventory	Purchases	Pharmacy Floor Area (sq ft)	Percent of Census	Pharmacy Hours Open	Pharmacist Hours/ Week	Technician Hours/ Week	Support Personnel Hours/ Week	Number of Hospitals Reporting
New England States CT,MA,ME,NH,RI,VT	231	$119,828	$ 883,689	1,697	69%	85	287	257	112	95
Middle Atlantic States NJ,NY,PA	300	142,505	1,131,737	2,117	74%	95	319	232	96	222
East North Central States IL,IN,MI,OH,WI	268	136,670	1,151,229	2,113	59%	110	357	335	121	336
West North Central States IA,KS,MN,MO,ND,NE,SD	219	100,669	848,660	1,639	54%	95	271	230	98	201
South Atlantic States DC,DE,FL,GA,MD,NC,SC,VA,WV	264	131,033	1,211,851	1,872	61%	100	348	359	148	237
East South Central States AL,KY,MS,TN	223	101,238	911,424	1,632	60%	99	266	264	90	121
West South Central States AR,LA,OK,TX	218	109,680	967,514	1,482	52%	102	264	223	130	164
Mountain States AZ,CO,ID,MT,NV,NM,UT,WY	174	107,690	823,612	1,585	54%	99	263	174	88	90
Pacific States AK,CA,HA,OR,WA	218	106,942	984,443	1,495	56%	103	302	264	112	184
United States Average	**244**	**121,198**	**1,032,831**	**1,799**	**60%**	**100**	**309**	**276**	**114**	—

PHARMACY SERVICES

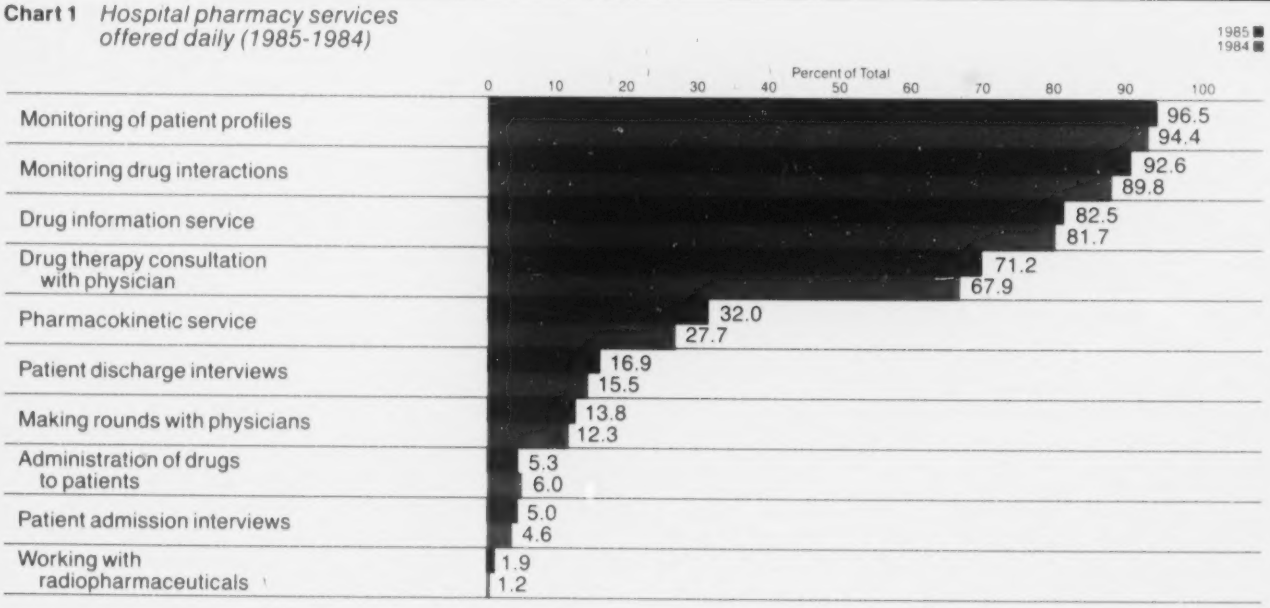
Pharmacy services performed daily by SURVEY respondents are listed in Chart 1 and are arranged according to the percentage of total mentions in the sample. The ranking for 1985 was the same as for 1984. Virtually every pharmacy service listed showed a higher percentage for 1985 than for 1984. It is interesting to note that pharmacokinetic service has demonstrated a more than fivefold increase since 1978 (up from 6.2% in 1978 to 32% in 1985). These data suggest that hospital pharmacies are continuing to expand their clinical services.

SURVEY participants were asked to indicate whether specific pharmacy services are a routine part of their program. The percentages of general and specialized hospitals offering these services are tabulated below.

Hospitals with these services were assigned much the same ranking regardless of their profile. The percentage of general and specialized hospitals involved in drug utilization review and student training programs increased from the previous year. However, a smaller percentage of pharmacies reported issuing regular pharmacy bulletins and responding to CPR attempts in both types of hospitals for 1985 than for 1984. Specialized hospitals increased their in-service education programs, whereas general institutions' support of these programs appeared to decrease.

	Percent of Total	
Service Available	**General**	**Specialized**
Drug utilization review	90.0%	92.1%
In-service education	85.9%	91.0%
Regular pharmacy bulletin	61.6%	80.9%
Training program for students	52.2%	74.9%
Responding to CPR attempts	32.4%	29.7%

Chart 1 *Hospital pharmacy services offered daily (1985-1984)*



PHARMACY OPERATIONS MANAGEMENT

During the past few years, hospital pharmacy managers have said that a tabulation and analysis of operating statistics pertaining to pharmacy department personnel and their drug distribution function would be useful. Table 8 lists selected operating data from general and specialized hospitals arranged according to hospital size. Some data were figured on the basis of occupied beds, which yields more definitive figures for comparison.

The average bed capacity for general and specialized hospitals within each hospital size falls about mid-range. Figures for annual census, pharmacy hours open, floor area, and length of patient stay go up with increasing hospital size, regardless of hospital profile. One explanation for the upward trend in patient stay may be that larger hospitals offer more sophisticated services, and, as such, may treat a larger number of acutely ill patients. Length of patient stay appears to be about the same in hospitals of similar size, regardless of profile.

Among both general and specialized institutions with more than 200 beds, pharmacist hours worked per week per occupied bed remain relatively constant. It should be noted that this figure is higher for specialized hospitals than for general facilities of similar size. The previously noted expanded patient services offered by specialized institutions may be one explanation for this difference. The figures for technician hours worked per week per occupied bed behave somewhat differently. In general hospitals, these figures tend to go down as bed size increases, whereas in specialized facilities, technician hour figures vary within a relatively narrow range. More technician hours were worked per week per occupied bed in specialized institutions than in general hospitals of similar size. Annual staff payroll per occupied bed tended to decline steadily with increasing bed capacity in general facilities. Conversely, annual staff payroll for specialized hospitals with more than 200 beds usually went up as bed size increased. As expected, annual payroll is lower in general institutions than in specialized hospitals of similar size.

Average inventory-per-occupied-bed figures tend to go down as general hospitals grow in size. However, in specialized hospitals, these figures fluctuate across most bed ranges but appear to trend downward as hospital size increases. Inventory for specialized

Table 8 *Operations management*

General

Operating Statistics	Bed Capacity						
	Under 50	50-99	100-199	200-299	300-399	400-499	Over 499
Average bed capacity	36	73	140	243	340	436	571
Census	42%	49%	54%	63%	66%	64%	68%
Pharmacy hours open per week	43	63	91	115	139	147	149
Length of patient stay (days)	4.5	5.0	5.3	6.4	6.6	6.7	7.3
Pharmacist hours per week*	3.0	2.3	2.2	1.9	1.9	1.9	1.9
Technician hours per week*	2.7	2.0	1.8	1.5	1.5	1.8	1.4
Pharmacy staff annual payroll*	$3,435	$2,685	$2,578	$2,231	$2,398	$2,294	$2,177
Average inventory*	$1,528	$1,092	$ 883	$ 694	$ 678	$ 711	$ 568
Purchases*	$6,958	$5,872	$6,194	$5,870	$6,023	$6,354	$5,573
Nonparenteral orders per week*	88	89	99	86	83	82	n/a
Parenteral orders per week*	15	15	12	11	9	8	n/a
Central pharmacy floor area (sq ft)	342	633	1,184	1,887	2,474	2,937	3,497
Orders per staff hour	18	24	28	28	27	24	n/a

*Figured on a per-occupied-bed basis.

facilities is higher than for general hospitals of comparable size. Purchases per occupied bed in general hospitals with 50 to 500 beds tend to be relatively constant at about $6,000. Among specialized institutions, these figures appear to vary considerably and show no definitive trend. However, figures for purchases per occupied bed are larger in these hospitals than in general hospitals of similar size. The inventory turnover rate for general hospitals shows an upward trend, from 4.5 inventory turns per year in the smallest hospitals to 9.8 in the largest. In specialized institutions, the inventory turnover rate ranges from 8.9 times per year in the smallest hospitals to 10.0 in the group with more than 500 beds.

Both parenteral and nonparenteral medication orders per week per occupied bed in both general and specialized hospitals tend to go down as hospital size increases. Parenteral medication includes hyperalimentation preparations, irrigation solutions, large- and small-volume IV admixtures and reconstitutions; nonparenteral medication includes unit- and multi-dose inpatient drug orders as well as outpatient prescriptions dispensed. Since length of stay is shorter in smaller hospitals, it may be that more medications are being dispensed per bed since patient turnover is higher. In other words, with more new patients, more medication is required.

A figure representing the number of medication orders processed per pharmacy staff hour worked may be useful for comparison. It is derived by dividing weekly medication orders by the sum of pharmacist and technician hours worked per week. Such calculations were made for both general and specialized hospitals and are shown in Table 8. When these figures for general and specialized hospitals of about the same size are compared, they appear to be quite similar. Since they fluctuate within a relatively narrow range regardless of hospital size or profile, the average value of 26 seems representative and may be used for comparison.

Specialized

Operating Statistics	Bed Capacity						
	Under 50	50-99	100-199	200-299	300-399	400-499	Over 499
Average bed capacity	n/a	n/a	158	246	341	438	699
Census	n/a	n/a	59%	62%	65%	72%	72%
Pharmacy hours open per week	n/a	n/a	101	129	143	149	159
Length of patient stay (days)	n/a	n/a	5.4	6.2	6.4	6.9	7.5
Pharmacist hours per week*	n/a	n/a	2.5	2.1	2.4	2.1	2.3
Technician hours per week*	n/a	n/a	2.3	1.8	1.9	1.8	2.1
Pharmacy staff annual payroll*	n/a	n/a	$3,334	$2,492	$2,892	$2,718	$2,937
Average inventory*	n/a	n/a	$ 999	$ 840	$ 878	$ 806	$ 826
Purchases*	n/a	n/a	$8,938	$6,348	$7,557	$7,689	$8,259
Nonparenteral orders per week*	n/a	n/a	121	106	99	91	85
Parenteral orders per week*	n/a	n/a	13	10	12	11	10
Central pharmacy floor area (sq ft)	n/a	n/a	1,554	1,952	3,050	3,311	4,886
Orders per staff hour	n/a	n/a	28	30	26	26	22

*Figured on a per-occupied-bed basis

SATELLITE PHARMACY OPERATIONS

In recent years, hospital pharmacy directors have indicated that their department's involvement in satellite pharmacy services has increased significantly. To provide more specific data about this service, the LILLY HOSPITAL PHARMACY SURVEY requested selected information (Table 9).

Over 375 (22.8%) SURVEY participants operate a satellite pharmacy service. Of these, over one third are in general hospitals, and almost half are in specialized institutions. Table 9 shows that, as hospital bed size increases, the percentage of pharmacies offering satellite pharmacy service also goes up, regardless of profile. Among general hospitals with more than 500 beds, half offer this service to patients, whereas nearly three fourths of the largest specialized facilities do so. In both general and specialized hospitals, as size increases, the type and number of satellite units also tend to increase.

With expanding satellite pharmacy service, it follows that more hours are worked per week by pharmacists and technicians. In general hospitals with more than 50 beds, the ratio of pharmacist hours worked to satellite hours open tends to remain relatively constant at 1.2 until the largest bed range is reached. The same trend occurs with the technician hours ratio of about 0.7.

Among specialized hospitals with more than 200 beds that offer satellite pharmacy service, the ratio of hours worked by pharmacists and technicians to hours open generally goes up as size increases. The larger proportion of satellites among specialized institutions further emphasizes the differences in operations found in general and specialized hospitals.

Table 9 *Satellite pharmacy operations*

General

Bed Capacity	Percent Operating Satellites	Type of Satellite Unit		Total Hours in Operation	Total Pharmacist Hours/Week	Total Technician Hours/Week
		Stationary	Mobile			
Under 50	n/a	n/a	n/a	n/a	n/a	n/a
50-99	3%	0	1	41	48	39
100-199	11%	1	1	54	62	39
200-299	16%	1	2	81	84	52
300-399	20%	2	2	130	150	92
400-499	43%	2	2	118	147	108
Over 499	50%	3	1	148	230	269

Specialized

Bed Capacity	Percent Operating Satellites	Type of Satellite Unit		Total Hours in Operation	Total Pharmacist Hours/Week	Total Technician Hours/Week
		Stationary	Mobile			
Under 50	n/a	n/a	n/a	n/a	n/a	n/a
50-99	n/a	n/a	n/a	n/a	n/a	n/a
100-199	31%	1	2	70	101	n/a
200-299	25%	2	2	65	72	59
300-399	40%	2	2	134	173	143
400-499	65%	2	2	161	223	229
Over 499	72%	4	4	260	374	384

STAFF PRODUCTIVITY MEASUREMENT

For some time, hospital pharmacy literature has suggested the use of a method to evaluate pharmacy department workload and staffing levels in order to maximize departmental productivity.

One method that has been described is based on the categorization of the pharmacy department's work activity into six basic tasks. Time values for each task are determined by means of time and motion studies. The sum of the time values is then compared with pharmacy staff hours worked, and a productivity indicator is calculated. This indicator can then be evaluated and compared with productivity indicators of similar hospitals.

Task	Standard Time Value (minutes)
Unit-dose medication order	2.9
Hyperalimentation preparation	37.4
Large-volume parenteral with additive	6.4
Small-volume parenteral with additive	7.0
Multidose medication order (inpatient and outpatient)	9.6
Large-volume parenteral without additive	2.9

The time values listed above take into account all activities required for the performance of the task, such as administrative and managerial functions, clinical activities, drug dispensing and distribution, meetings, staff consultations with other health care professionals, clerical time, and idle time.

A blank productivity work sheet may be found on page 19. Using this work sheet, the pharmacy department's productivity indicator can be calculated by dividing the standard time required to dispense pharmaceuticals by available staff time. If the productivity indicator is less than 1, there is more pharmacy staff time available than the pharmacy workload requires, and the possibility of overstaffing exists. A productivity indicator figure approaching 1 suggests that pharmacy staff hours and workload are in balance. When the indicator figure exceeds 1, the pharmacy department staff is more productive than usual. Comparison of an individual pharmacy's productivity indicator with that of a similar-sized hospital of the same profile allows a more accurate evaluation of a department's productivity, since certain efficiencies seem to relate to size.

Table 10 lists the productivity indicators for general and specialized hospitals according to bed range. The average productivity indicators for both general and specialized hospitals tend to rise as bed size increases until the highest bed ranges are reached. All the average productivity indicators are greater than 1, which may suggest that the time values or figures for unit doses dispensed may be overstated. Regardless of the literal value of each index, the trend is certainly valid.

As expected, adjusting hospital pharmacy staff hours by one full-time equivalent results in a much greater variation in the smaller-sized hospitals than in larger ones (*see* Table 10).

Table 10 *Productivity indicators*

General

	Under 50	50-99	100-199	200-299	300-399	400-499	Over 499
Less 1 FTE*	1.65	1.72	1.79	1.76	1.57	1.40	n/a
Usual average	1.01	1.34	1.58	1.64	1.50	1.35	n/a
Plus 1 FTE*	0.73	1.10	1.42	1.53	1.43	1.31	n/a

Specialized

	Under 50	50-99	100-199	200-299	300-399	400-499	Over 499
Less 1 FTE*	n/a	n/a	1.66	1.77	1.51	1.65	1.33
Usual average	n/a	n/a	1.53	1.66	1.45	1.60	1.31
Plus 1 FTE*	n/a	n/a	1.42	1.57	1.40	1.56	1.29

*The equivalent of 40 pharmacy staff hours.

COMPARATIVE ANALYSIS WORK SHEET

If you wish to perform your own analysis, this work sheet may be useful.

If your pharmacy's operating data are affected by any of the variables that appear beneath each entry, adjust the comparative figure by consulting the appropriate table listed.

1. Hospital profile
   - General ☐
   - Specialized ☐
   - Other ☐
2. Bed capacity _____
3. Geographic location _____

	Yes	No
4. Unit-dose system	☐	☐
5. IV admixture service	☐	☐

Operating Data	Current Data	Previous Year's Data	Survey Data (Comparable Category)
Inventory* (at cost) for 1985 Use Table 3 for averages and Table 7 to adjust for geographic variation. Refer to Table 4 if inventory includes IV or irrigation solutions or blood fractions.	$ _____	$ _____	$ _____
Purchases* (at cost) for 1985 Use Table 3 for averages and Table 7 to adjust for geographic variation. Refer to Table 4 if purchases include IV or irrigation solutions or blood fractions.	$ _____	$ _____	$ _____
Estimated inventory turnover ratio† Use Table 3 for averages.	_____ times	_____ times	_____ times
Pharmacist hours worked per week Use Table 6 for averages.	_____ hours	_____ hours	_____ hours
Technician hours worked per week Use Table 6 for averages.	_____ hours	_____ hours	_____ hours
Pharmacy hours open per week Use Table 8 for averages.	_____ hours	_____ hours	_____ hours
Annual pharmacist payroll Use Table 6 for averages.	$ _____	$ _____	$ _____
Pharmacy floor size Use Table 8 for averages.	_____ sq ft	_____ sq ft	_____ sq ft

*Include prescription drugs, IV and irrigation solutions, and blood fractions, if normally in pharmacy's budget.

†Estimated inventory turnover ratio = $\frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

PRODUCTIVITY WORK SHEET

Pharmacy Workload

Task	Standard Time Value (minutes)	Total (workload units)	Total Standard Time (minutes)
Unit dose	2.9		
Hyperalimentation	37.4		
Large-volume IV (additives)	6.4		
Small-volume IV (additives)	7.0		
Multidose prescriptions (inpatient, outpatient)	9.6		
Large-volume IV (w/o additives)	2.9		
			Total

Total standard workload hours = $\frac{\text{total standard time (minutes)}}{60}$ = $\frac{\qquad}{60}$ = _____

Pharmacy Staff Hours

Pharmacy staff	Available hours
Pharmacist (drug distribution)	
Pharmacist (management)	
Pharmacist (clinical practice)	
Technician (drug distribution)	
Support personnel	
	Total available hours

Productivity indicator = $\frac{\text{total standard workload hours}}{\text{total available hours}}$ = _____ = _____

CONCLUSION

The implementation of prospective payment systems in the hospital marketplace emphasized cost-containment procedures in all hospital areas, including pharmacy. As a result, many hospital pharmacy directors face the challenge of providing effective health care while containing costs at the same time. In some cases, directors report major reorganizations within their departments to meet these two objectives.

The decrease in hospital length of stay observed in 1984 appears to have continued during 1985. When patients spend less time in the hospital, there is an increased need for effective pharmaceuticals that are prepared quickly and accurately.

If pharmacy managers are to keep pace with the issues and changes in hospital pharmacy practice, it is essential that they identify and analyze emerging trends in order to plan effectively for the future. It is the hope of Eli Lilly and Company that this survey will contribute in some measure to this process.

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